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ABSTRACT

The major focus of this document is to report the current status of the Iowa-ASSIST program, a statewide education improvement model aimed at helping students, teachers, administrators, and citizens to improve science teaching and science offerings in their communities and schools. Described are procedures for establishing 15 regional service centers, university coordination efforts, program outcomes between 1972-1976, and current trends in Iowa-ASSIST programs. Tables list data regarding workshop offerings and locations, science curriculum (SCIS, ESS, SAPA, and ES/OBIS) implementation within the years 1972-1976, numbers of schools using those selected programs for the same years, and numbers of in-service teachers affected by the Iowa-ASSIST program. (CS)

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The University of Iowa

August 1979

technical report 19

The Development and Maintenance of a Unique and Effective In-Service Teacher Education Model

by

Daniel S. Sheldon

SE 030 346

The Technical Report Series

The Technical Report Series of the Science Education Center, University of Iowa, was established by action of the faculty during 1973. The series provides a mechanism for communicating results of research, developmental projects, and philosophical investigations to others in Science Education. The reports include details and supporting information not often included in publications in national journals.

Authors of technical reports include the faculty, advanced graduate students, alumni, and friends of science education at Iowa. Technical reports are distributed to all major Science Education Centers in the United States. Reports are also generally available upon request for the cost of packaging and mailing.

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Since the primary function of the Technical Report Series is communication, comments from you and other consumers of the series are solicited.

Robert E. Yager, Coordinator
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The Development and Maintenance of a Unique and Effective In-Service Teacher Education Model

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Technical Report 19

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INTRODUCTION

Much has been written in the recent past about the need for a new approach to in-service education. In-service programs for teachers have varied little in their purpose over the past 50 years. They are still viewed by teachers as a necessary evil which will move a teacher horizontally across the pay scale, to meet "barrier credit" requirements, or as a form for greater visibility in the professional world.

Within the past decade, a shift in emphasis has taken place. The prescriptive format focusing on crash programs aimed at arousing the teacher's enthusiasm for a new curriculum adopted by the district has given way to remedying teacher deficiencies in such areas as "mainstreaming," instructional models for the gifted and talented, interpersonal relations, and classroom application of learning theories. In addition, there is increased interest in career education, metrification, health and environmental/energy education.

All the signs point to further changes in in-service education. Ralph Tyler predicts:

> In-service education of the future will not be seen as shaping teachers, but rather, will be viewed as aiding, supporting and encouraging each teacher's development of teaching capabilities that he values and seeks to enhance.

According to Louis Rubin, the central question is who shall determine the direction of teachers in-service will take. The issue is one which divides the experts, with one side favoring external direction, the other calling for teacher self-determination. The thrust of Iowa-ASSIST has been one of mutual cooperation.

Demographic data show a dramatic decrease in new teachers entering the profession, and an increase in the age of our teaching force. Also, when coupled with the declining student population, it is apparent that the teachers

who will form the bulk of our teaching profession ten or twenty years from now are, in all probability, in the classroom today. Any improvement that we can gain in instruction ten or twenty years from now will come from helping teachers currently teaching to do a better job today.

Evolution of Iowa-ASSIST

A series of preliminary discussions relative to an assessment of Iowa's critical needs in science education occurred during the Academic Year Institute (AYI) programs 1968-72 and during the 1973-74 Leadership Development Project (LDP). Such discussions involved science educators from colleges and universities, teacher organizations, administrators, leaders from the State Department of Public Instruction, local and regional science supervisors, and teacher groups across the State. From these talks a new concept emerged which was termed Iowa-ASSIST. ASSIST is an acronym for Alternatives and Services for Schools for Improving Science Teaching. The major effort of this new education model would be to help students, teachers, administrators, and citizens in improving science teaching and science offerings in their communities and schools. It was planned that through a statewide network of regional centers, Iowa-ASSIST would provide the expertise and coordination necessary to assist in statewide science education improvement efforts.

As the second decade of major national efforts to restructure and upgrade the nature and effect of science instruction evolved, it was evident that the net impact on schools was not commensurate with the time and money invested to date. By themselves, the national curriculum projects and the teacher training institutes had indeed been excellent. However, their impact in the schools was disappointing. Nationally, a thorough reassessment of education programs occurred and major changes in directions were soon expected. Thus, the development of a concept such as Iowa-ASSIST appeared to be timely.

Iowa-ASSIST has become an integral part of the Science Education Center and represents a major effort with in-service education in Iowa. The program was initiated during 1973-74 as a part of the Leadership Development Project

funded by the National Science Foundation. The 1974-75 academic year was the first year for direct support of Iowa-ASSIST with support from the Instructional Improvement Implementation Section of the National Science Foundation.

Supplementary funds totalling $90,000 were provided by the 1976 Iowa State Legislature as a means of incorporating Iowa-ASSIST into the regular structure of the College of Education at The University of Iowa. Iowa-ASSIST was funded during the 1973-76 three years with a total of $575,390 provided by the National Science Foundation. Continuing support as a regular feature of the Science Education Center and the College of Education has provided for materials development, evaluation of impact, monitoring instruction, data analysis, and added administrative costs associated with services and instruction at centers throughout the State. Instruction, research, and service designed to improve science education in the State is central to the mission of Iowa-ASSIST.

The Functioning Model

Basic to Iowa-ASSIST has been the establishment of fifteen regional service centers throughout the State. A regional coordinator, often a science consultant for the Area Educational Agencies, has been identified and acts in each region to initiate and carry out a variety of improvement efforts. Such coordinators have developed communication networks with all schools (administrators and science teachers) in their geographical areas. In general, the ASSIST regions respect the same boundaries as those of the Area Educational Agencies.

The Iowa-ASSIST staff includes a Director who is the Coordinator of the Science Education Center at The University of Iowa. It also includes an Associate Director and Coordinator of Field Activities, and a Coordinator of Instruction and Evaluation. Affiliated staff includes Director of Student Programs and the Director of Iowa-UPSTEP. Other University of Iowa staff include four one-half time graduate assistants who serve in the following

capacities:

(a) Coordinator of the Interactive Curriculatorium and Tour-Iowa program;

(b) Coordinator of the Materials/Dissemination Center;

(c) Curriculum Development Specialist and Editor of ECOPAC; and

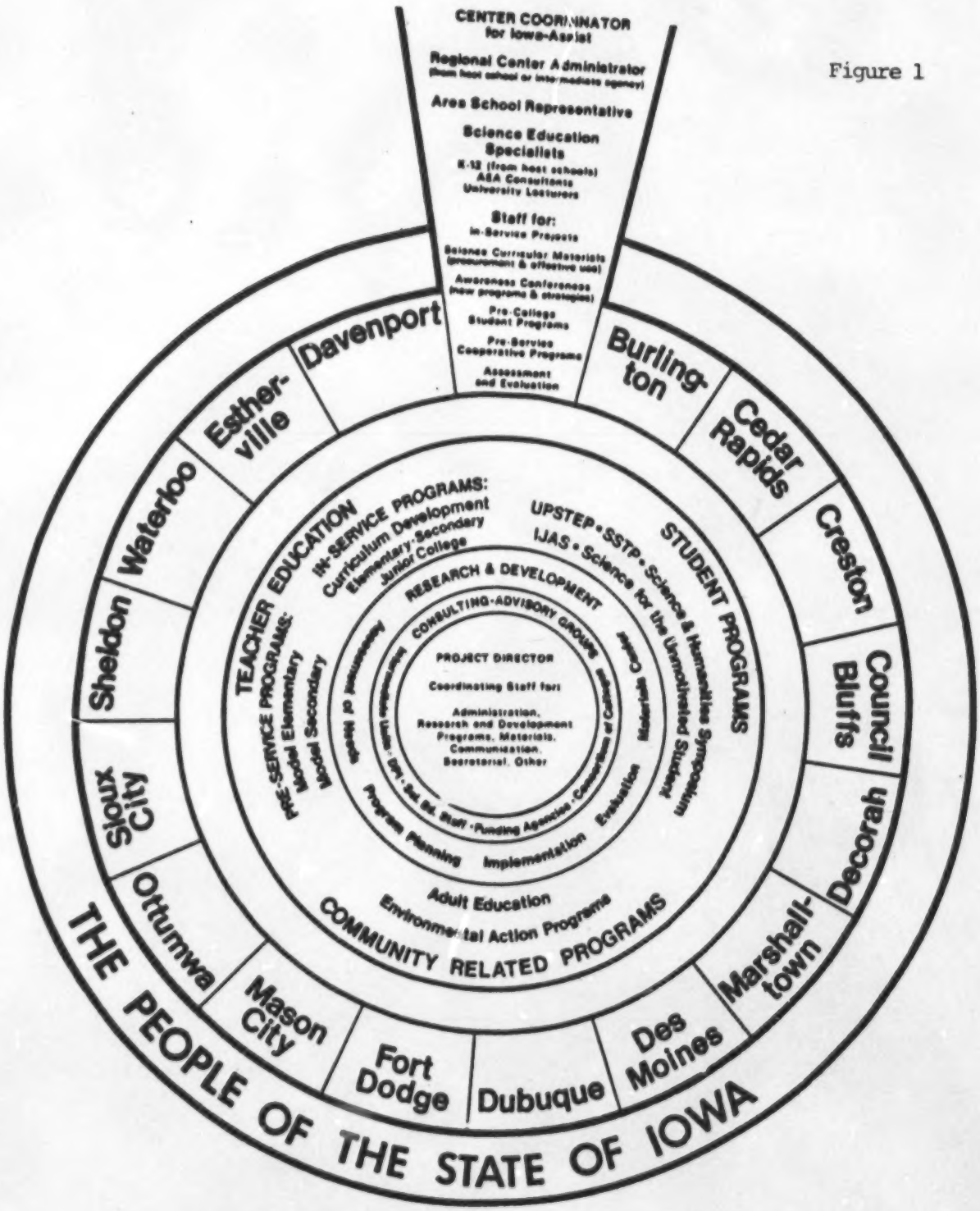
(d) Program Evaluation and Research Assistant.

In addition, a secretarial staff and work-study assistants provide support services for all the various components of the program.

Figure 1 is an attempt to conceptualize the ASSIST Model diagramatically. The Model consists of five levels, the Coordinating Staff, the Consulting-Advisory Groups, Research and Development, Programs--Teacher Education, Student, Community Related, and the Regional Centers. The level relationship is designed to indicate a flow of information, ideas, and needs from the regions into the coordinating staff, who acting upon the suggestions of regional coordinators, direct the regional information to the research and development team. The research and development group assesses, plans, directs implementation, supplies soft and hardware curriculum materials, and evaluates the regional-designed-program. At any point in time, regions can select the designed on-going programs indicated at the fourth level.

The following is a list describing the specific make-up and responsibilities for each level of the Model: 1) Project Coordinator and Coordinating Staff--This group functions primarily at The University of Iowa. The Iowa-ASSIST Center staff, responding to the requests and needs of the regions, makes available consultants, curriculum materials, and the services of the center. A channel of communication was established at the center for dissemination of Iowa-ASSIST information and of Science Education news at the state and national level (ASSIST News & Notes is published quarterly and ASSIST Staff Notes monthly); 2) Consulting-Advisory Groups--The members make information of their particular expertise available to the central

Figure 1



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staff and to the Program areas; 3) Research and Development--The team assesses the stated needs of each region, plans, prepares implementation instruments, and evaluates regional-designed programs while maintaining constant evaluation and reassessment of on-going programs in science education throughout the State; 4) Programs--Teacher Education, Student, and Community Related--The programs, directed in the areas of pre- and in-service teacher education, students-academically oriented and less motivated, and community related, including adult education and local environmental students, are intended to be on-going programs throughout the State. Each region designs programs or modifies existing programs to meet their particular needs; 5) Regional Centers--The centers of science education in the State of Iowa are the dynamic satellites of the total program where the needs in education within a given geographic boundary (Iowa) are continually being identified and actively given a response.

The major concepts and service possibilities characterizing Iowa-ASSIST include the following:

1. Coordination of Effort. Rather than to continue the operation of a number of isolated science education programs by various institutions throughout the State, Iowa-ASSIST has established a consortium for the purpose of restructuring our approach to a common problem. Preliminary discussions regarding this matter indicated that the major teacher education programs within the State share: a) common concern for and awareness of the need for more effective means of improving science education programs, and b) a willingness to coordinate individual efforts into a more unified focus. The increased communication and manpower that stems from much cooperation makes possible a much more dynamic and effective science program for the schools of Iowa.

2. Regional Involvement. That persons closely involved with students and classroom activities should play a major role in the development of any new approach to a more effective science program is a basic premise of Iowa-ASSIST. In addition to local schools, Area Education Agencies serve as meet-

ing places where persons from institutions of higher learning and from local schools meet to plan for the future. All planning is done in the respective regional centers, thereby insuring a closer congruence between program development and the critical needs of the schools within a specific region.

3. Cooperative Effort. Both institutions of higher learning, through government funding, and local schools, through their regular instructional and curriculum development budgets, cooperate financially and professionally in the planning and implementation of new programs or the restructuring of those now in existence. This cooperation includes the following phases of development:

A. Educational Needs Assessment teams comprised of local school representatives and university evaluation specialists cooperate in conducting a thorough, professional assessment of the critical education needs within given geographic regions. These, together with an assessment of the physical and financial limitations within which specific schools must operate, serve as the basis for 1) determining program objectives, 2) evaluating the effectiveness of existing programs, and 3) proposing curricular changes.

B. Curriculum and Program Development. With the help of university consultant service and in-service programs housed at respective regional centers, the selection, adaptation, or development of curricula follow. This incorporates the recommendation of the Needs Assessment team in order to provide a program suitable to the specific school for which it is designed.

The establishment of the regional center as a curriculum development center has the advantage of providing close at hand consulting services from a consortium member, together with teacher education programs to assist the implementation of selected curricula.

4. Self-Sustaining Program Development. Moreover, the regional center functions to provide continuous reassessment, replanning, and consultative services over the years which ensures continuously viable and up-to-date

science programs. Once government funds have been withdrawn, the efforts they have made possible continue as a normal part of the operating budgets of both consortium institutions and local schools. Here the centers provide invaluable sources of data for researchers and opportunities for pre-service internships, and a continuing close-working alliance between universities and schools, thereby enabling local schools to reap a much fuller benefit from their university resources in terms of continued consultation and in-service education.

5. Instructional Materials Center. Included in the preliminary concept of Iowa-ASSIST was the establishment of an instructional Materials Center in the Science Education Center at The University of Iowa. Here, those materials determined essential for program implementation are assembled or manufactured and disseminated at the lowest possible costs. Since the Materials Center works in response to the needs of Iowa schools as reported by assessment teams, an efficient, cost effective system of material supply is developed for the maximum benefit to participating schools.

The process of selecting and operating programs is the distinguishing feature of the Iowa-ASSIST model. The process, utilizing a closely defined problem-solving technique, centers on planning and evaluation as essential channels through which programs are developed. Highlights of the process include:

(1) measuring and assessing education needs of the regional districts;

(2) identifying and priority ranking of deficiencies;

(3) setting minimum acceptable standards for solutions;

(4) specifying desired outcomes;

(5) searching for alternative methods to achieve desired outcomes;

(6) choosing the most promising acceptable methods;

(7) organizing and implementing programs; and

(8) evaluating results of new programs.

Program Outcomes Between 1972-1976

Tables 1, 2, 3, and 4 provide specific data concerning implementation of national curriculum in Iowa schools as a result of the Iowa-ASSIST program (Sheldon and Yager, 1976). It is at once apparent that the program had enormous impact in terms of the in-service assistance it has afforded. Significant increases in the adaption/adoption of the newer programs resulted because of the Iowa-ASSIST program operating in the State during the 1972-1976 period.

An import component of Iowa-ASSIST is the assessment and evaluation effort. Specific reports concerning these studies have been reported elsewhere (Wilson, 1975). In general, significant content achievement was measured in students in each workshop concerned with each curriculum program. Analysis of audio-tapes revealed that students developed significantly in terms of their ability to practice inquiry skills. Participants grew significantly in terms of their perceptions of the nature of specific curricula and the approaches recommended. In addition, measurements illustrated significant changes in affective areas. There is considerable evidence that the Iowa-ASSIST program was successful in changing teachers, their perceptions, their approaches to teaching science, and their knowledge.

The major activity of Iowa-ASSIST is the assistance provided to schools for directly implementing or revising major science curriculum programs in Iowa schools. Initially, the program provided more assistance with implementing science programs in elementary schools than in secondary schools. Major programs which were emphasized include: Elementary Science Study (ESS); Science Curriculum Improvement Study (SCIS); Science: A Process Approach (SAPA); Unified Science and Mathematics for Elementary Schools (USMES); Modular Activities Program in Science (MAPS); and Science 5/13. Secondary programs in which assistance has been provided include: Intermediate Science Curriculum Study (ISCS); Introductory Physical Science (IPS); Technology-People-Environment

Table 1

WORKSHOPS OFFERED AS PART OF IOWA-ASSIST

Curriculum	Total Number of Workshops	Number of Participants
Elementary Science Study (ESS)	19	452
Science: A Process Approach (SAPA)	7	182
Science Curriculum Improvement Study (SCIS)	12	302
Environmental Studies/Outdoor Biology Instructional Strategies (ES/OBIS)	16	387
Unified Science and Mathematics for Elementary Schools (USMES)	1	13
Developing Mathematical Processes (DMP)	1	24
Intermediate Science Curriculum Study (ISCS)	4	70
Introductory Physical Science (IPS)	2	35
Technology-People-Environment (TPE)	8	120
Subtotal	60	1,585
Awareness Conferences		
(Two week / Administrators)	3	135
(Two week / Teachers)	2	60
(One day / Administrators & Teachers)	62	1,350
TOTAL	127	3,130

Table 2

IOWA-ASSIST WORKSHOP LOCATIONS

CENTER	ESS	SAPA	SCIS	ES/OBIS	USMES	DMP	ISCS	IPS	TPE	Total Workshops At Each Center
Calmar			1	2						3
Mason City			2	1			2			5
Estherville	1				1					2
Ft. Dodge	1		1	1				1	2	6
Marshalltown	1	1	1	2						5
Waterloo				1						1
Dubuque	1		3	1						5
Davenport	3		1					1	2	7
Cedar Rapids	3		1	1		1			1	7
Des Moines		1	1	1			1			4
Sioux City	2			1					1	4
Council Bluffs		2		2						4
Creston	1								1	2
Ottumwa	1			1			1			3
Burlington		1	1	2						4

Curriculum Key:

ESS - Elementary Science Study
SAPA - Science: A Process Approach
SCIS - Science Curriculum Improvement Study
ES/OBIS - Environmental Studies/ Outdoor Biology Instructional Strategies
USMES - Unified Science and Mathematics for Elementary Schools
DMP - Developing Mathematical Processes
ISCS - Intermediate Science Curriculum Study
IPS - Introductory Physical Science
TPE - Technology-People-Environment

Table 3

Four Years of Selected Curriculum Implementation in Iowa

Curriculum	1972-73			1973-74			1974-75			1975-76		
	Schools	Teachers	Students	Schools	Teachers	Students	Schools	Teachers	Students	Schools	Teachers	Students
SCIS	4	63	1,386	38	308	8,045	83	388	11,640	94	420	11,890
ESS	5	94	1,974	50	344	9,563	73	394	10,976	81	467	13,076
SAPA	3	43	1,075	30	272	8,266	52	300	9,300	65	334	9,352
ES/OBIS	0	0	0	3	5	260	83	195	6,240	148	326	9,780

Table 4

Percentage of Schools Using Selected Programs in Iowa

Curriculum	1972-73	1973-74	1974-75	1975-76
SCIS	0.9	8.4	18.2	20.6
ESS	1	11	16	17.8
SAPA	0.6	8.4	11.4	14.3
ES/OBIS	0	0.6	18.2	32.5

Curriculum Key:

SCIS - Science Curriculum Improvement Study
ESS - Elementary Science Study
SAPA - Science: A Process Approach
ES/OBIS - Environmental Studies/Outdoor Biology Instructional Strategies

(TPE); Interdisciplinary Activities in Chemistry (IAC); and Individualized Science Instructional System (ISIS). Assistance was provided in the areas of mathematics and social studies as well. In addition, a K-12 Environmental Studies Program developed by Iowa-ASSIST personnel proved to be a desirable supplement to existing courses and programs.

Staff teams for each curriculum program were formulated. Each of these teams was headed by a professor from The University of Iowa and includes local supervisors, key teachers, curriculum representatives, and professors from other colleges and universities (who are formally named University Lecturers).

Typically, the progression of activity starts with an Awareness Conference (usually for administrators and key teachers). Following such conferences, meetings with local teacher groups, community leaders, and central administrators are held as a decision to adopt a given program is made. After such a decision, teachers are invited to participate in a special in-service instructional program. Such a program includes a summer introductory workshop (usually two or three weeks in length) which is held at the regional center. Such workshops are designed to provide an introduction to the content, the organization, and the teaching strategies which characterize a given program. Following the summer workshop, a series of in-service meetings (usually six sessions each scheduled for a duration of three hours for each semester) are planned. In addition, school intervisitations, staff visits, and meetings in individual schools all represent informal instructional strategies. The use of the new materials in classrooms with students is central to the academic year phase. Such classrooms represent the "laboratory" for the course(s). Typically, each teacher participant earns six semester hours of graduate level credit for the summer and the academic year sequence. In some instances, the academic year program can be waived if the implementation effort does not require it.

Three activities which characterize Iowa-ASSIST occur and operate from the Science Education Center. First is the general administration of the

program, including course outlines, assigning credit, staffing each program at each center, and communication from center to center, and program to program. A second activity is program. This includes assistance with needs assessment prior to or concurrent with awareness activities. The primary objective, however, is to evaluate the effectiveness of the implementation effort in terms of successful and continuing use of the new materials in given schools. The third central activity is the operation of a Resource Center. This Center includes sample materials for each new program for hands-on experience at the Science Education Center or in the field. It also includes the development and distribution of new materials which can be used to supplement and enrich the regular program materials. A Materials Center also provides a source for laboratory materials and other expendable supplies needed for each of the programs. Orders can be filled quickly and inexpensively. Many times, such materials have been delivered directly to the school.

Current Trends in Iowa-ASSIST Programs

With the disappearance of direct NSF support, several Iowa-ASSIST foci are now more central and more essential. With NSF support, most attention was directed to assisting schools and teachers with adopting (or adapting) national curriculum programs in Iowa schools. Although this continues as a major activity, other outreach efforts are now receiving more attention.

Awareness conferences for teachers, administrators, and community groups have always been available. However, such conferences are now available for all groups, at all levels, and at all centers in Iowa on an expanded basis. These conferences are available regarding national curriculum programs, curriculum revision efforts, field centers for teacher education, and special student program opportunities. An Interactive Curriculatorium is also available as a feature of the Science Education Center. The Curriculatorium is a place where groups of teachers, administrators, or others can come to interact

individually with actual curriculum materials and supplement/enrichment materials developed by Iowa-ASSIST staff. Such persons can also become familiar with all aspects of Iowa-ASSIST. Such visits are recommended to substitute for or to expand from experiences and information gained via awareness conferences.

The data from Tables 5 and 6 show a major shift with respect to in-service programming. During the past two years several in-service trends can be identified from the accompanying tables as follows: (1) there is much greater utilization of the Materials Center and Interactive Curriculatorium, (2) a substantial increase in teachers participating in workshops and extension courses has occurred in the past year, (3) the auxiliary services component of Iowa-ASSIST have expanded considerably during the past two years. These include increased utilization of the Materials Center, conducting more awareness conferences, and administering a variety of special projects, i.e., Local Ecology Project, Chautauqua Short Courses, an annual Science & Education Conference, and the summer Curriculum Up-Date Conference.

NUMBER OF IN-SERVICE TEACHERS AFFECTED
BY
Iowa-ASSIST

TABLE 5 - (1973-1977)

YEAR	Local Ecology Project (LEP)	Chautauqua Short Courses	Special Campus Based Conferences	Curriculum Revision (UPSTEP)	ASSIST Workshops & Conferences	ASSIST Awareness Conferences	School Visitations	Campus Visitations (Tour-Iowa)	Materials Center and Interactive Curriculatorium	Professional Meetings	Totals
1973-74	-	-	63	20	350	173	143	46	10	114	919
1974-75	-	-	97	20	900	204	200	63	24	258	1766
1975-76	-	-	104	24	772	311	246	103	58	320	1938
1976-77	275	180	258	49	374	516	306	211	106	832	3107
TOTAL	275	180	522	113	2396	1204	895	423	198	1524	7730

TABLE 6 - (1977 Through Summer 1979)

1977-78	254	180	270	40	220	620	356	205	180	848	3173
1978-79	244	180	300	43	282	709	420	360	272	950	3760
1979-80 Through Summer 1979	-	-	315	51	301	750	-	409	355	862	3043
TOTAL	498	360	885	134	803	2079	776	974	807	2660	9976

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Assistance with curriculum revision in local schools in collaberation with Iowa-UPSTEP is another important facet of Iowa-ASSIST. Special workshops involving staff teams are organized in local schools (or if financing can be arranged, on campus) where teachers are retained with an extended contract during a portion of the summer months. A curriculum revision workshop usually means a ten-day workshop during June, July, or August with intensive group activities followed with individual writing efforts. Follow-up meetings for the following academic year are often arranged when the curriculum revision is a major one. Assistance with implementing such revision with students is often essential to the success of the effort.

A major Iowa-ASSIST effort now is the Materials Center. Basically, this service is one of providing cost effective supplies, equipment, and special materials for science programs. The program provides for volume procurement and free distribution in the State. In addition, materials/activities are developed by request from teachers in the field. Instead of merely placing orders and waiting for the arrival of materials, in-service help is available in using the materials and planning other improvement activities. The Materials Center is a major function of the Iowa-ASSIST model which, although it will not become self-supporting, provides a valuable service to educators throughout Iowa.

Another ongoing feature of Iowa-ASSIST exists with the various publications. Some of these include descriptive brochures, evaluation and assessment reports, and reports of field service projects completed by leaders across the State. Various catalogues and newsletters are also important means for communication. ECOPAC is one example of a subscription program for providing periodic enrichment materials for schools. Most publications are provided on a cost basis. Such materials are popular with educators and are being expanded both in terms of content as well as number as interests and demands dictate.

Special programs, materials, and training opportunities exist in such areas as health, drug, and environmental education. Iowa-ASSIST continues to recognize the applied nature of school science as a future emphasis. The necessity for a more relevant sequence which emphasizes interdisciplinary approaches to schools and societal programs is recognized.

Student programs represent an expanding area as a greater variety of opportunities for talented and interested K-14 students is made available. More trips, excursions, state and regional conferences, and action oriented projects are available. A new Tour-Iowa program provides opportunities for structuring special tours designed to meet a variety of individual, class, and school needs.

Another direction for Iowa-ASSIST is providing opportunities for teachers to structure particular graduate programs to meet their own individual needs. Major portions of these programs can be made available in local settings. Many are cooperative programs involving staff and courses from other colleges offered as a part of a planned program of the University of Iowa. Teachers are encouraged to explore such possibilities on an individual basis. One limitation is caused by the need for ten or more persons at a given setting interested in specific courses. As one might assume, it is very difficult, if not impossible, to offer courses on a one instructor-one student basis.

During a period where science is being questioned by many educators if it is a "basic," Iowa-ASSIST has been able to expand many of its services as well as affecting teachers directly through conferences, workshops, and professional meetings. This increase of activity, we feel is a direct result of the underlying strength of the Iowa-ASSIST in-service model. Namely, it is a <u>cooperative</u> effort among the various local, regional, and state agencies charged with in-service and a genuine attempt is made to <u>coordinate</u> improve-

ment activities through communication.

Iowa-ASSIST represents a major dimension for science education in Iowa. The program is on a sound base with support from the State--like all other programs that are a part of the public system of higher education in Iowa. As a concept, it is an enlarging one. Although further NSF support will be sought as new programs and direction are formulated, the central program exists without reliance on federal funding. Such independence for the latter half of the 1970's has enabled new foci to emerge. Others are being planned while others are still to be imagined!

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